

Investments and innovations in large state-owned and privatized companies in Poland

1. Introduction

The centrally planned economy was characterised by a high degree of production concentration in large companies, which frequently held an oligopolistic or monopolistic position. In 1990 large companies (employing over 500 persons) generated 83% of total industrial sales and employed 80% of total work force in industry¹. Moreover, large companies were more involved in innovations than small and medium-sized firms, as they were receiving preferential treatment in the economic policy; they were allocated bigger funds for investments; they had their own research and development centres and employed valuable, highly skilled specialists.

Despite intensive changes occurring in the structure of industry in recent years, large companies continue to play an important role in the economy. In 1997 they generated 65.1% of total industrial sales and employed 58.7% of total work force in industry². They are, moreover, still characterised by higher propensity to investment and higher labour productivity than remaining companies³. It means that many of them managed to carry out comprehensive

¹ Statistical Yearbook 1991, Central Statistical Office, Warsaw 1991, p. 290.

² Statistical Yearbook of Industry 1998, Central Statistical Office, Warsaw 1998, p. 10.

³ M. Zawadzki, Export Capabilities of Large Companies, Polish Academy of Sciences, institute of Economics Working Papers, no. 13/1998.

restructuring and ensured a stable position in the market for themselves. . Simultaneously, however, restructuring processes in some companies proved to be insufficient and their financial and market situation deteriorated considerably.

Privatisation is treated as an important element in the restructuring process of public companies and as a factor stimulating innovation propensity. Polish companies are privatised by means of different methods. Two such methods, that is the capital privatisation method and the indirect privatisation method receive most attention in analyses of privatisation in empirical research. Yet, the effectiveness of a privatised company management is determined not only by the method of its privatisation but also by ownership structure shaped as a result of it (degree of ownership dilution, types of strategic investors).

The basis for analysis of the impact exerted by different forms of ownership on propensity to investment and innovation are findings of empirical studies carried out by the Institute of Economic Sciences, Polish Academy of Sciences on the sample of 200 companies in 1998⁴. The sample was selected so that it could include companies, which were among the largest ones in different sectors of the manufacturing industry at the beginning of the transformation process.

Among 200 companies, in which rich statistical data were collected (for the period 1990-1997) and in which detailed questionnaire surveys were carried out, there were 89 companies still belonging to the public sector and 111 privatised companies. Statistical data and information gathered in surveyed companies will be analysed in two cross-sections:

The first one makes allowances for division of the analysed sample into two groups: 89 companies, which are still public property (Public) and which include state-owned enterprises, joint stock companies belonging to the State Treasury as the sole stockholder, and companies belonging to the National Investment Funds - but such in which no further changes in the structure of ownership took place after joining the Funds, and 111 companies privatised between 1990 and 1997 (Privatised).

In the second cross-section the analysed sample was divided into seven groups according to the criterion of predominance of specific types of capital in the ownership structure of particular companies:

⁴ Research Project PBZ-001-09 on "Restructuring of Large Enterprises" carried out by the Institute of Economic Sciences, Polish Academy of Sciences for the Minister of Treasury. The project is headed by prof. U. Grzelonska. We are on the research team.

- K1 - companies privatised through the capital privatisation method with participation of foreign strategic investors (38 companies);
- K2 - companies privatised through the capital privatisation method with participation of domestic strategic investors (23 companies);
- K3 - companies privatised through a public offering of shares, which do not have investors with majority interest (17);
- K4 - privatisation in the form of establishing employee-owned companies (19);
- K5 - companies belonging to the National Investment Funds (40);
- K6 - companies covered by bank conciliation procedures, as a result of which they were transformed into joint stock companies with their debt swapped for equity, but most shares are held by public entities (creditors). This group includes also joint stock companies established in a different way, which have one characteristic in common, i.e., public ownership prevails in their structure of ownership, but it does not reach 100% of all shares (22);
- K7 - joint stock companies of the State Treasury as their sole stockholder and remaining public companies (41).

2. Investments in the light of empirical studies⁵

The real investment effort and its influence on changes in company assets are shown by the index of capital stock replacement measured as a ratio of investment outlays to depreciation (Table 1).

Investment supremacy of privatised companies could be seen from the beginning of the analysed period. However, the variation was relatively small during the period of recession and it was reaching from over ten to several dozen percentage points in 1991 (data for 1990 can be treated as not fully reliable due to unavailability of information for a part of companies). Investment outlays declined in both groups of companies then, and companies were interested primarily in maintaining appropriate levels of working capital.

⁵ S. Krajewski, Investment Activity of Large State-owned and Privatized Companies, Polish Academy of Sciences. Institute of Economic Sciences, Working Papers, no. 3, 1999.

Table 1. Index of capital stock replacement

Types of companies	1990	1991	1992	1993	1994	1995	1996	1997
Public (Pb)	1,45	1,26	0,94	0,96	0,82	0,88	0,72	1,32
Privatised (Pr)	2,46	1,43	1,47	1,70	1,34	2,44	2,41	2,80
K1	2,28	2,12	2,32	2,46	1,76	2,86	3,29	3,48
K2	2,91	1,18	1,21	1,46	0,97	1,48	1,87	2,39
K3	2,07	1,50	0,85	1,35	0,99	1,77	2,14	3,24
K4	2,84	1,44	0,98	1,22	1,81	4,42	2,40	2,59
K5	0,88	0,49	0,77	0,83	0,96	0,83	0,81	1,29
K6	1,90	0,85	0,50	0,89	0,37	0,94	0,75	0,76
K7	1,92	1,94	1,22	1,20	0,76	0,89	0,59	1,44

Source: S. Krajewski, Investment Activity of Large Public and Privatised Companies, Polish Academy of Sciences, Institute of Economic Sciences, Working Papers, no. 3, 1999

Possibilities of funding investment were improving steadily along with improvement of business conditions. Trends, which appeared at that time, point to an intensive investment activity in most privatised companies. It concerns, in particular, joint stock companies with foreign capital and employee-owned companies. Companies with foreign capital pursued the most stable investment policy throughout the entire analysed period, with their investment outlays most frequently exceeding depreciation two or three times.

Quite intensive investment activity of employee-owned companies is quite a surprise. Major variations in investment outlays could be observed here in particular years, which were matching depreciation only in 1992 and were much higher in the remaining years (reaching even 4.4 in 1995). The index of capital stock replacement in employee-owned companies was higher than in joint stock companies listed on the Stock Exchange and in joint stock companies with domestic strategic investors. It means that frequently expressed apprehensions that employee-owned partnerships would be giving strict priority to current consumption (wages) and they would not be able to raise finance for investments enlarging their production potential do not find confirmation.

Public companies display a much smaller ability to invest. The investment index did not increase significantly here until 1997 (1.32), but it is hard to assess whether it can imply their entry onto the growth path. It is quite unlikely taking into consideration intensification of their difficulties in 1998 (slow-down in sales, deterioration of financial results).

It is also worth noting that investment outlays were very small in the group of companies included in the National Investment Funds. Their investment outlays were a little bigger than accumulated depreciation (1.29) only in one year (1997). Thus, even simple reproduction does not take place in these companies. It can imply that their financial resources are allocated primarily for sustaining current production. Such approach must lead to weakening their position in the market in the long term and carries a threat of eliminating them completely from the market.

It is quite likely that the National Investment Funds include many companies, which seek external support, as they are unable to embark themselves upon activities securing their long term stable position in the market and they do not have a clear privatisation perspective.

Small investment outlays are typical also for creditor-owned companies, which were established mainly through debt-equity swaps. It was only in 1990 that investment outlays in these companies were bigger than accumulated depreciation. In 1992 their investment outlays were reaching only a half of accumulated depreciation, and in 1994 only one-third. It reflects intensifying difficulties faced by public companies covered by the programme of financial restructuring. However, the level of their investment outlays was also quite low in the last few years, that is, already after transforming them into creditor-owned companies. Hence, it can be presumed that a marked improvement of effectiveness did not occur in these companies and restructuring measures allowed them only to survive but they did not solve problems threatening their elimination from the market.

Investment outlays in the group of public companies and joint stock companies with the State Treasury as their sole stockholder appeared to be bigger than in companies belonging to the National Investment Funds and in companies undergoing bank conciliation processes. Their situation was relatively quite good especially in the years 1990-1993 even in comparison with privatised companies. Later on their investment activity slowed down, although it coincided with the period of economic revival in Poland and intensification of investments in privatised companies. Some improvement took place in 1997, but it is difficult to assess whether it will have a long-term character, particularly, in conditions of economic stagnation in 1998. Lack of abilities to benefit from better business conditions and intensify investments can hardly be a favourable testimony of their ability to cope with existing problems and implement their strategies successfully.

Table 2 shows the percentage structure of investments made in recent years. Data contained in it allow to draw conclusions about investment priorities.

Capital stock replacement investments are given preference by companies belonging to groups K2, K4, K5, K6, and K7. New productive capacities are created, particularly, in companies belong to K2 and K1 groups. In the last group (foreign investors) the greatest attention is attached to building new distribution networks.

**Table 2. Structure of investments made in recent years
(% of respondents' choices)**

Types of investments	Types of companies							
	Total sample	K1	K2	K3	K4	K5	K6	K7
1. Capital stock replacement	26,7	17,2	13,7	36,6	31,4	28,8	31,8	31,6
2. Modernisation	38,5	44,1	38,5	30,0	31,2	41,5	41,6	35,7
3. New productive capacities	18,5	22,9	35,8	19,1	18,8	13,1	7,0	15,7
4. New distribution networks	3,3	7,1	3,8	4,9	1,2	1,1	1,0	3,5
5. Ecological investments	6,9	5,7	5,3	5,5	9,1	8,4	11,9	4,5
6. Work safety and hygiene	2,4	2,4	1,6	2,9	0,6	4,0	1,3	2,5
7. Others	3,7	0,6	1,3	1,0	7,7	3,1	5,4	6,5
Total sample	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: see Table 1.

The majority of analysed companies (53.4%) expressed an opinion that the main factor hampering growth of investments is deficit of finance. Such opinion was expressed in 64.4% of public companies and 42.7% of privatised companies. The latter would list the following other factors hampering investments: redundant assets (the most important factor for 14.7% of companies), heavy tax burdens (13.3%), insufficient domestic demand (13.3%), and shortage of finance for current activity (4%). In turn, some public companies considered the biggest constraints to investment to be: deficit of finance for current activity (11.0% of companies), insufficient domestic demand (6.8%), heavy tax burdens (5.5%).

Thus, deficit of finance is directly or indirectly the main factor making it impossible to increase investments in 81.0% of public enterprises and 60.0% of private ones. Insufficient domestic demand appears to be the main constraint

for quite few companies, but it should be remembered here that such opinions were gathered in mid-1998, which is before the crisis in Russia.

Investments are funded primarily by means of own finance supported by domestic loans. It refers both to public and privatised companies. It is worth noting that main sources of finance for investments are characterised by relative stability. These opinions are confirmed by data to be found in Table 3.

Table 3. Sources of finance for investments (% of respondents' choices)

Types of companies	Own finance	Domestic loans	Foreign loans	Subsidys	Others
I. During initial period of transformation					
Whole sample	76,7	19,4	1,8	0,5	1,6
Public (Pb)	77,6	17,7	2,8	0,6	1,3
Privatised (Pr)	75,9	20,8	0,3	0,4	2,6
II. After privatisation (and for public companies: years 1994-1997)					
Whole sample	72,2	16,7	2,4	1,4	7,3
Public (Pb)	75,5	15,0	3,0	2,0	4,5
Privatised (Pr)	69,5	18,2	1,9	0,9	9,5

Source: see Table 1.

In their investment plans for coming years companies do not predict a bigger role of loans in financing their investments but rather their declining share: to about 15% in public companies and about 16.5% in privatised ones. These data indicate that loans are still too expensive for companies. The smallest share of loans in funding investments is recorded by employee-owned companies, where it does not surpass 9%. Scale of investment outlays made in the 1990s affects the age of capital stock possessed by companies today. Relevant information can be found in Table 4. Public companies have a much smaller share of new machines and equipment used for a period shorter than five years (14.2%) than privatised companies (26.3%). Among the latter, the biggest share of new machines and equipment (under five years) can be found in companies with major interest of foreign investors (30.9%), which confirms their significant involvement in investments.

Privatised companies used their capital stock more effectively than public companies. It is confirmed by the analysis of shift-work coefficient (Table 5) and utilisation of machines and equipment during the first shift (Table 6). Thus, companies having more new fixed assets utilise these assets more effectively, which can be considered a positive phenomenon.

Table 4. Age of machines and equipment in analysed companies

Age category of machines and equipment	Share of companies belonging to different age categories									
	Total	Pb	Pr	K1	K2	K3	K4	K5	K6	K7
0 - 5 years	20,8	14,2	26,3	30,9	23,0	25,5	33,0	13,4	8,5	17,3
6 - 10 years	18,8	18,6	19,0	22,5	18,5	23,4	15,1	22,8	8,4	17,3
11 - 15 years	16,9	17,8	16,1	16,6	17,3	20,8	7,8	18,8	20,4	15,5
over 15 years	43,5	49,4	38,6	30,0	41,2	30,3	44,1	55,0	62,7	49,9
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: see Table 1.

Table 5. Shift-work coefficient

Share of companies operating different shifts	Types of companies									
	Total sample	Pb	Pr	K1	K2	K3	K4	K5	K6	K7
	3,7	4,8	2,9	2,9	5,0	0,0	0,0	0,0	15,8	2,9
One shift	23,3	27,1	14,3	14,3	10,0	7,1	17,6	18,9	26,4	37,2
Two shifts	50,7	41,8	56,1	51,6	45,0	78,6	59,0	67,5	42,2	34,6
Three shifts	24,9	26,3	26,7	33,5	35,0	14,3	17,5	13,6	15,6	25,3
Four shifts	1,1	0,0	2,0	0,0	5,0	0,0	5,8	0,0	0,0	0,0

Source: see Table 1.

Table 6. Utilisation degree of productive capacities

Degree of utilisation of productive capacities	Types of companies									
	Total sample	Pb	Pr	K1	K2	K3	K4	K5	K6	K7
under 50%	14,4	15,6	13,4	19,5	13,6	,00	11,8	10,5	33,4	10,8
51-70%	27,3	36,2	20,2	16,7	13,6	25,1	39,4	44,8	9,6	37,8
71-90%	40,6	36,2	11,2	36,1	50,0	56,3	29,4	36,9	57,0	32,4
above 91%	15,4	12,0	22,1	37,7	22,8	18,6	19,4	7,8	0,0	19,0

Source: see Table 1.

Changes in company assets occurring in the years 1990-1997 were not only a result of investments and liquidation forced out by their physical deterioration. In that period companies began shedding these assets for the first time in many decades, which proved to be no longer needed in new conditions or too expensive in exploitation. The scale of this phenomenon is confirmed by data in Table 7 showing sale and free-of-charge transfer of assets. It appeared that:

- a) Public and privatised companies sold or transferred free of charge similar parts of their assets, although assets of privatised companies had been reduced considerably already before privatisation.
- b) Very few cases of radical reduction of assets were recorded in both groups. Only 6.3% of public companies and 11% of privatised companies sold over 30% of their assets, and 2% and 3.4% respectively transferred them free of charge.

More detailed information about assets shed by companies can be found in Table 8. Very similar shares (about 20%) of public and privatised companies were shedding organised parts of capital stock, unnecessary inventories (62-66%), and welfare-service facilities (61-69%). Considerably more public companies got rid of land, buildings and machines.

Table 7. Scale of shedding assets by analysed companies in the years 1990-1997

Part of assets shed by company	Types of companies									
	Total sample	Pb	Pr	K1	K2	K3	K4	K5	K6	K7
I. Sale of assets (% of surveyed companies)										
under 5%	58,8	55,0	62,2	53,1	66,7	66,7	75,0	55,6	42,1	63,2
6-15%	19,4	21,3	17,8	25,0	16,7	20,0	0,0	27,8	21,1	13,2
16-30%	13,5	17,5	10,0	2,5	5,6	13,3	8,3	13,9	21,1	15,8
31-50%	5,3	2,5	7,8	6,3	5,6	0,0	16,7	2,8	15,8	0,0
above 50%	2,9	3,8	2,2	3,9	5,6	0,0	0,0	0,0	0,0	7,9
II. Transfer of assets free of charge (% of surveyed companies)										
under 5%	75,0	76,0	74,1	69,6	90,0	70,0	88,9	76,0	61,5	77,8
6-15%	19,4	18,0	20,7	26,1	10,0	20,0	11,1	20,0	15,4	22,2
16-30%	2,8	4,0	1,7	0,0	0,0	0,0	0,0	4,0	15,4	0,0
above 30%	2,8	2,0	3,4	4,3	0,0	10,0	0,0	0,0	7,7	0,0

Source: see Table 1.

**Table 8. Types of assets shed by analysed companies in the years 1990-1997
(% of all analysed companies)**

Items	Types of companies									
	Total sample	Pb	Pr	K1	K2	K3	K4	K5	K6	K7
1. Organised parts of plants and machines	20,9	21,6	20,4	25,7	14,3	12,5	17,6	23,1	36,4	14,6
2. Land	43,5	53,4	35,0	37,1	33,3	37,5	11,8	53,8	59,1	51,2
3. Buildings and production premises	30,4	42,0	20,0	17,1	14,3	25,0	5,9	48,7	40,9	39,0
4. Welfare-service facilities	64,9	69,3	61,2	62,9	42,9	75,0	52,9	79,5	81,8	56,1
5. Machines and equipment	64,9	73,9	57,3	54,3	57,1	62,5	47,1	82,1	77,3	63,4
6. Unnecessary inventories of materials and production in progress	63,9	65,9	62,1	60,0	66,7	56,8	58,8	71,8	68,2	61,0
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: see table 1.

A desire to get rid of obsolete or unnecessary capital stock and socio-welfare facilities in order to improve the company's results was the most frequent reason of sale or transfer of assets. Such solution was declared by 70% of public and privatised companies. The second frequently given reason was a desire to get rid of assets no longer needed due to reduced demand (trend confirmed by over a half of public companies and one-fourth of privatised companies). Meanwhile, sale of assets to obtain money for covernig liabilities was not a reason given frequently by respondents. It was declared by not more than over ten percent in each group of companies.

Owing to investments, shedding a part of assets and liquidating deteriorated elements of assets, companies could boast in 1998 assets, the technical standard of which differed considerably from that in 1990 (Table 9). Assessment of technical standard characterising the main part of capital stock in analysed companies in 1998 in comparison with other competitive companies operating in Poland at that time can be found in Table 10. The assessment is based on subjective and discretionary criteria and, hence, it most probably contains many inaccuracies and it does not always reflect the real

situation trully. It can be a base, however, for formulating certain reflections. An argument indicating that the assessments are not biased optimistically is a moderate percentage of opinions suggesting that technical standard of analysed companies is the highest in a given sector.

Table 9. Technical standard of capital stock in comparison with other competitive companies operating in Poland in the same sector during the early period of transformation (% of opinions)

Technical standard	Types of companies									
	Total sample	Pb	Pr	K1	K2	K3	K4	K5	K6	K7
1. Is the highest in sector	9,4	11,6	7,5	11,4	0,0	0	11,1	12,8	9,5	12,8
2. Is higher than in average domestic companies	30,2	30,2	30,2	22,9	34,8	52,9	22,2	43,6	19,0	20,5
3. Is somewhat lower than in average domestic companies	16,1	10,5	20,8	25,7	21,7	29,4	5,6	5,1	9,5	17,9
4. Is much lower than in average domestic companies	5,7	3,5	7,5	8,6	13,0	0,0	11,1	0,0	4,8	5,1
5. Is similar	31,3	37,2	26,4	17,1	21,7	17,6	44,4	30,8	52,4	38,5
6. It is hard to assess	7,3	7,0	7,5	14,3	8,7	0,0	5,6	7,7	4,8	5,1
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: see Table 1.

Table 10. Present technical standard of capital stock in analysed companies in comparison with other companies operating in Poland (% of opinions)

Technical standard	Types of companies									
	Total sample	Pb	Pr	K1	K2	K3	K4	K5	K6	K7
1. Is the highest in sector	12,0	5,8	17,0	16,7	9,1	17,6	27,8	10,3	4,8	5,1
2. Is higher than in average domestic companies	39,1	34,9	42,5	47,2	50,0	64,7	16,7	38,5	23,8	33,3
3. Is somewhat lower than in average domestic companies	10,9	10,5	11,3	8,3	13,6	11,8	16,7	10,3	4,8	12,8
4. Is much lower than in average domestic companies	4,7	5,8	3,8	5,6	4,5	0,0	5,6	0,0	9,5	7,7
5. Is similar	26,6	37,2	17,9	11,1	13,6	5,9	33,3	33,3	42,9	38,5
6. It is hard to assess	6,8	5,8	7,5	11,1	9,1	0,0	0,0	7,7	14,3	2,6
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: see Table 1.

Table 11. Technical standard of capital stock in comparison with western companies in the same sector during the early period of transformation (% of opinions)

Technical standard	Types of companies									
	Total sample	Pb	Pr	K1	K2	K3	K4	K5	K6	K7
1. Matches leading world companies	1,6	0,0	2,8	2,8	8,7	0,0	0,0	0,0	0,0	0,0
2. Matches average world companies	17,7	25,6	11,3	8,3	13,0	17,6	17,6	20,8	9,5	20,5
3. Is somewhat lower than in average world companies	28,1	26,7	29,2	27,3	13,0	52,9	23,5	33,3	23,8	25,6
4. Is much lower than in average world companies	27,0	33,7	39,6	44,4	52,2	23,5	41,2	25,6	33,3	38,5
5. It is hard to assess	15,6	14,0	17,0	16,7	13,0	5,9	17,6	10,3	33,3	15,4
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: own estimates based on questionnaires.

Comparison of data in Table 9 (concerning situation during the early period of transformation) with the data in the above table shows that:

- 1) Technical standard of privatised companies has risen considerably in comparison with average technical standard in a given sector. This group contains today over twice as many companies having the highest technical standard in their sector and twice fewer companies, which have the lowest technical standard.
- 2) Technical standard of most analysed public companies has not changed. However, unfavourable shifts have occurred in extreme groups - share of companies with the highest technical standard has declined twofold and share of companies with the lowest technical standard has risen.

It has probably improved the competitive position of privatised companies in the Polish market and deteriorated the position held by public companies.

Table 11 presents opinions about technical standard of the basic part of capital stock in analysed companies during the early period of transformation in comparison with western companies in the same sector. These data compared with information in Table 12, which characterise the present technical standard of analysed companies, lead to two conclusions:

- 1) Technical standard of privatised Polish companies has risen very significantly, which should improve their competitive position both in domestic market and in foreign markets.
- 2) Technical standard of public companies has not changed significantly, although some signs of improvement in this field can be observed. It should be treated as a success and an expression of their still potentially maintained ability to survive.

Table 12. Present technical standard of capital stock in analysed companies in comparison with foreign companies in the same sector (% of opinions)

Technical standard	Types of companies									
	Total sample	Pb	Pr	K1	K2	K3	K4	K5	K6	K7
1. Matches leading world companies	6,8	2,3	10,4	16,2	9,1	5,9	11,8	2,6	0,0	2,6
2. Matches average world companies	37,5	31,4	42,5	45,9	50,0	58,8	29,4	38,5	9,5	30,8
3. Is somewhat lower than in average world companies	22,9	25,6	20,8	13,5	18,2	23,5	13,5	33,3	28,	20,5
4. Is much lower than in average world companies	22,4	31,4	15,1	16,2	13,6	0,0	29,4	20,5	33,3	35,9
5. It is hard to assess	10,4	9,3	11,3	8,1	9,1	11,8	5,9	5,1	28,6	10,3
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: see table 1.

3. Propensity to innovation in analysed companies

Both product and process (technological) innovations have been introduced in analysed companies in recent years. There are no grounds to say that any of these types of innovations was clearly given a bigger preference on the scale of entire sample. Taking into consideration the division of the sample into public and privatised companies, it should be pointed out that the interest shown in product innovations was very similar in both groups, whereas process innovations were given much bigger priority in privatised companies.

It appears that 43.8% of public companies and 51.5% of privatised companies launched products, which had not been produced in Poland earlier.

More ambitious innovations consisting in launching products, which had not been sold in Poland earlier (and, hence, did not have their equivalents in imports) were undertaken by 29.5% of public companies and 30.8% of privatised companies. Over 40% of companies (42.5% of public and 40.4% of privatised) enriched their product range by adding new products but already produced in Poland by other companies.

These innovations had, however, an insignificant influence on the product range of most companies. According to 67% of public companies and 65.7% of privatised companies only small changes occurred in their product range (Table 13). In the entire sample only in a few cases a part of production went beyond the sector's traditional profile, and only two companies (1%) went beyond their sector, that is, as a result of innovations most of their products go beyond the sector's profile.

Table 13. Changes in product range between 1990 and 1997 (% of opinions)

Product range	Types of companies									
	Total sample	Pb	Pr	K1	K2	K3	K4	K5	K6	K7
1. No major change	31,1	28,2	33,3	40,5	31,8	11,8	50,0	21,6	38,1	26,8
2. Insignificant changes	35,2	38,8	32,4	29,7	27,3	52,9	16,7	48,6	33,3	34,1
3. Significant changes	29,5	30,6	28,7	21,6	36,4	35,4	27,8	29,7	28,6	34,1
4. Part of products go beyond traditional profile of sector	3,1	1,2	4,6	8,1	4,5	0,0	5,6	0,0	0,0	2,4
5. Change of sector - company produces most products going beyond profile of sector	1,0	1,2	0,9	0,0	0,0	0,0	0,0	0,0	0,0	2,4
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: see Table 1.

These findings do not arouse optimism considering that in the early 1990s the level of production modernity was quite low and adaptation of products to needs unsatisfactory. If major changes in product range were recorded by only 30% of companies during the period of several years, then there is justified a conclusion that the process of product restructuring should be accelerated.

Measures taken by companies in the field of product policy in the years 1990-1997 in order to preserve or improve their position in the market are

shown in Table 14. Typical behaviour, characteristic of about 70% of companies, consisted in widening the product offer and upgrading quality, purchasing new machines and equipment, and also expanding promotion and advertising. Such strategy would yield certain advantages, especially in the domestic market, relatively fast and with moderate expenditures. It could not guarantee, however, a significant improvement of competitive position in the long term, as such measures could not bring about any radical changes in standard of modernity and quality of products.

Table 14. Measures in the field of product policy taken by companies in the years 1990-1997

Types of taken measures	Share of companies taking definite measures		
	Total sample	Pb	Pr
1. Widening of product range	70,6	71,6	69,7
2. Increasing outlays on R&D	20,8	15,9	24,8
3. Lowering unit costs	45,7	43,2	47,7
4. Upgrading product quality	70,6	67,0	73,4
5. Receiving quality certificate (e.g. ISO 9000)	27,4	26,1	28,4
6. Expanding promotion and advertising	67,0	64,8	68,8
7. Launching cost monitoring	35,0	33,0	36,7
8. Reducing product range	12,7	12,5	12,8
9. Purchasing new technologies	24,4	17,0	30,3
10. Purchasing new machines and equipment	62,9	62,5	63,3
11. Concluding agreements with suppliers on quality, technical parametres	21,8	18,2	24,8
12. Concluding agreements with customers on quality, prices, parametres of products, servicing	15,2	12,5	17,4
13. Organising own distribution network	38,6	30,7	45,0
14. Designing new logo	23,4	21,6	24,8

Source: see Table 1.

Much smaller part of companies (15.9% of public and 24.8% of privatised companies) raised outlays on research and development. It means that regress occurred in most cases in this field, which in the long term can make it difficult or even impossible for companies to improve radically their technical and market position. After all, the analysis was conducted in large companies, which have the best possibilities and conditions to achieve successes relying on

their own R&D facilities. Negligence of own R&D facilities can be best seen in public companies, although some exceptions can be observed here. Thus, for instance, in the entire sample there were only two companies, which recognised that raising outlays on research and development played the main role in their product policy, and these companies belonged to group K7 (state owned enterprises and joint stock companies of the State Treasury as their sole stockholder).

Although measures taken by public and privatised companies were very similar as regards the form and scope of their impact, their effects tended to vary considerably in both groups, with privatised companies recording much greater effectiveness. Information showing how companies assess the effects of measures taken by them are presented in Table 15. Definitively positive effects were achieved by 16.3% of public companies and 44.4% of privatised companies. In turn, 25.6% of public and 12.1% of privatised companies did not record any tangible effects or their situation deteriorated. The greatest effectiveness (at least, 50%) was observed in groups K1, K2, and K4, and the smallest in K6, K7, and K5.

It is difficult to make a fully objective assessment of such big variations in effectiveness of measures taken by companies. First of all, full information about the amount of outlays incurred is unavailable. It should be accepted that they were bigger in privatised companies, which should pave the way for their greater effectiveness. Moreover, allowances have to be made for two reasons of greater effectiveness of the innovation policy pursued by privatised companies: quality of management and adopted directions of activity.

**Table 15. Results of measures taken in the field of product policy
(% of opinions)**

Results of taken measures	Types of companies									
	Total sample	Pb	Pr	K1	K2	K3	K4	K5	K6	K7
1. Definitively positive effects	32,0	16,3	44,4	50,0	50,0	35,3	52,6	16,7	13,6	19,0
2. Moderate improvement of company's position	50,0	58,1	43,5	44,4	36,4	52,9	42,1	61,1	45,5	57,1
3. Absence of tangible effects	13,4	18,6	9,3	2,8	9,1	11,8	5,3	11,1	36,4	19,0
4. Deterioration of situation	4,6	7,0	2,8	2,8	4,5	0	0	11,1	4,5	4,8
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: see Table 1.

Relatively good quality of management was achieved primarily owing to skillful selection of managers, creation of strong motivation, adoption of decision-making system based on properly chosen criteria and reliable information. Variations in taken measures were mainly due to the fact that privatised companies were more frequently oriented at: (i) making bigger expenditures on research and development; (ii) purchasing new technologies; (iii) organising their own distribution network. Thus, a greater concern was shown in adoption of new technical innovations and reaching potential customers with new products. Such choice of priorities proved to be effective.

Changes in technological processes being the other aspect of innovative activity - alongside changes in products - were carried out on a bigger scale in privatised than in public companies. Major process (technological) innovations were made in 72% of privatised companies and 53.5% of public companies over the last few years. Among companies changing technologies were over 81.1% of companies with predominant share of foreign investors and 81.6% of companies with strategic domestic investors, as compared with only 33.3% of creditor-owned companies set up as a result of conciliation agreements and other companies, where public ownership dominated.

Technologies were making their way to companies primarily through a direct purchase of machines and equipment. Such was the case with 107 companies, 84 of which bought machines and equipment in highly developed countries. This way of raising the standard of used technologies shows that installed machines and equipment could not be very modern at least for this reason that patent protection was not applied in their case. It appears that only 23 companies bought licences. Among them were 9 companies, where foreign capital predominated.

A prevailing source of technical and technological innovations introduced in production proved to be innovations developed by company own technical personnel. Such was the case in 56.1% of analysed public companies and in 51.9% of privatised companies. An important role played by this source of innovations indicates that such changes could not have a radical character, and they were restricted mainly to minor improvements.

Innovations developed by company own R&D units played an important role in 28.2% of public and 28.8% of privatised companies. Such shares can hardly be considered satisfactory taking into account the fact that R&D activity was conducted in large companies, which should have the most favourable conditions and possibilities for carrying their own R&D activity. Only every sixth or seventh company (14.6% of public and 17.3% of privatised companies) relied on innovations supplied by external domestic R&D entities. This modest

share of companies points, on one hand, to weaknesses of domestic R&D facilities and their insufficient capability of solving main technical problems of Polish companies and, on the other hand, to absence in companies of habits of tapping assistance provided by external entities, as well as shortage of finance for these purposes.

These assessments refer both to public companies and privatised ones, as sources of technical and technological innovations are very similar in them.

If it is assumed that foreign technologies, designs and blueprints generally represent a higher standard than Polish ones and are treated as better ones, it can be also recognised that considerable saturation with different elements of foreign technology is a favourable testimony of strategies pursued by companies and their position. Situation of privatised companies is more advantageous from this point of view, but variations are not too big in most cases. In 48.4% of privatised companies at least a part of production is based on foreign technology and in 17.2% of privatised companies over 60% of production is based on foreign technology. As regards public companies their situation is less favourable in this respect. Namely, 36.1% declare that they use foreign technology, with 15.8% of such companies basing most production on it. Foreign designs and blueprints are used by 43.5% of privatised companies and 41.1% of public companies, with 20.6% of the former and 12.3% of the latter basing most of their production on them.

4. Financial situation of analysed companies

We are accepting here that a relationship exists between financial situation of companies and their R&D activity in the long term. Indices allowing to compare changes, which took place over seven years under analysis, are presented in Table 16.

Between 1990 and 1997 the financial situation worsened in both groups of companies. However, unfavourable changes were occurring at varying rates. Despite difficulties privatised companies display ability to survive, while in the group of public companies the results are so unfavourable that many of them are threatened by being eliminated from the market. The crisis in international financial market in 1998 will lead most probably to further weakening of company finance and ability to survive. In this situation many companies will most probably cope with shortage of finance indispensable to conduct R&D activity strengthening their position in the market.

Table 16. Economic indicators of analysed companies

Items	1990		1997	
	Pb	Pr	Pb	Pr
1. Gross profitability rate	22.5	21.8	8.0	2.8
2. Net profitability rate	11.1	10.1	-9.9	0.8
3. Operating profitability rate	22.2	21.9	0.8	3.2
4. Quick ratio	0.90	0.96	0.90	0.96
5. Current ratio	2.02	2.09	2.05	2.06
6. ROA	9.3	8.5	-6.3	2.0
7. Debt ratio	0.27	0.28	1.74	0.50
8. Equity ratio	0.73	0.72	-0.74	0.49
9. Debt-equity ratio	0.42	1.10	4.58	2.01

Source: see Table 1.

Hence, it may become necessary for the economic policy to take into account the following issues:

1. Permit for elimination of a big part of public companies from the market;
2. Accelerate privatisation of public companies in order to stimulate pro-effectiveness tendencies in them;
3. Mitigate the fiscal policy and the monetary-credit policy to make it easier for companies to survive the difficult period.

Adoption of the first solution is rather unlikely, among other things, for social reasons. The second solution cannot be implemented in the short term. Hence, the third solution seems to be the most feasible.

5. Position of companies in the market

Assessing changes in the position held by companies in the domestic market, which took place between 1990 and 1997, it can be said that the situation of privatised companies improved and that of public companies deteriorated. It is confirmed by information contained in Table 17.

In 1990 the group of public companies included 28.5% of companies, with each of them holding a share of under 10% in their segment of domestic market. This share rose to 31.8% in 1997. In the group of privatised companies the corresponding shares amounted to 39.5% and 36.7%. On the other hand,

public companies with a big, surpassing 40% share in their segment of domestic market represented 34.3% of all such analysed companies in 1990 and 21.6% in 1997. Corresponding shares in the group of privatised companies were 23.4% and 24.0%, respectively.

Table 17. Market shares of companies in 1997

Market shares in 1997	Types of companies									
	Total sample	Pb	Pr	K1	K2	K3	K4	K5	K6	K7
from 0-2%	6,4	7,2	5,7	6,3	10,0	8,3	0	11,1	5,9	2,9
2-5%	17,9	18,8	17,2	9,4	15,0	25,0	21,4	18,5	29,4	17,6
5-10%	10,3	5,8	13,8	21,9	15,0	8,3	7,1	7,4	11,8	0,0
10-20%	19,9	24,6	16,1	12,5	10,0	16,7	28,6	22,2	35,3	20,6
20-40%	22,4	21,7	23,0	18,8	30,0	33,3	7,1	18,5	11,8	32,4
40-60%	9,6	11,6	8,0	15,6	0,0	8,3	7,1	14,8	0,0	11,8
60-80%	5,1	4,3	5,7	6,3	5,0	0,0	14,3	3,7	0,0	5,9
over 80%	8,4	5,7	10,2	9,4	15,0	0,0	14,3	3,7	5,9	8,8
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Source: see Table 1.

The majority of companies from the two groups (public and privatised) are exposed today to a much bigger competition on the part of domestic producers and imports than in 1990.

Threats posed by competition are experienced more strongly by public than privatised companies (in 1990 the situation was reversed). Relatively more favourable competitive position of privatised companies at the present time is most probably an effect, among other things, of their greater involvement in investments and innovations, which allows them to boast more modern assets, higher technological standards and product quality, as well as lower costs.

6. Evaluation of instruments of the economic policy

It would be desirable to present here also the impact exerted by the economic policy instruments on research and development activity of companies and their propensity to investment. Opinions gathered from respondents indicate that from among all such instruments (of general or specialised character) there

could be distinguished several instruments, which affected different aspects of company activity most strongly.

Four instruments were most frequently listed as the most important ones:

1. lowering of the interest rate on bank loans (51.3% of public and 53.8% of privatised companies);
2. possibility of receiving investment reliefs in the income tax (40.8% and 49.5%, respectively);
3. possibility of obtaining loans on preferential terms, i.e. with lower interest (42.1% and 35.2%);
4. tariff exemptions for machines and equipment of investment type, raw materials, semi-products and components themselves not produced in Poland (18.4% and 46.2%).

Only the first of these instruments has a general character. The second and the fourth are clearly specialised instruments being incentives for investments. Preferential loans are frequently granted in practice also for investments. Hence, it can be recognised that specialised instruments aimed at stimulating investments had an active influence on companies in recent years displaying greater effectiveness in the case of privatised than public companies.